

=> FILE REG

FILE 'REGISTRY' ENTERED AT 18:06:05 ON 21 SEP 2007
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=> DISPLAY HISTORY FULL L1-

FILE 'HCAPLUS' ENTERED AT 17:22:10 ON 21 SEP 2007

L1 115 SEA KUERZINGER ?/AU OR KURZINGER ?/AU
L2 549 SEA GRIEBEL ?/AU
L3 4992 SEA GEIGER ?/AU
L4 13373 SEA HERMAN ?/AU OR HERMANN ?/AU
L5 0 SEA L1 AND L2 AND L3 AND L4
L6 1 SEA L1 AND L2 AND L3

FILE 'HCA' ENTERED AT 17:27:20 ON 21 SEP 2007

L7 10718 SEA METAL####(3A)OXIDE#(3A) (PARTICL? OR MICROPARTICL? OR
NANOPARTICL? OR PARTICULAT? OR DUST? OR GRIT? OR GRAIN#
OR GRANUL? OR POWDER? OR FINES# OR PRILL? OR FLAKE# OR
PELLET? OR BB#)
L8 56751 SEA (SOL OR SOLS) (2A) (GEL OR GELS OR GELLED OR GELLING#
OR GELATION? OR GELATIN?)
L9 267 SEA L7 AND L8

FILE 'HCAPLUS' ENTERED AT 17:28:30 ON 21 SEP 2007

SEL L6 1 RN

FILE 'REGISTRY' ENTERED AT 17:28:32 ON 21 SEP 2007

L10 20 SEA (1303-86-2/BI OR 1314-23-4/BI OR 1344-28-1/BI OR
L11 11 SEA L10 AND M/ELS
L12 9 SEA L10 NOT L11
E BORON OXIDE/CN
L13 2 SEA "BORON OXIDE"/CN
L14 183 SEA (B(L)O)/ELS (L) 2/ELC.SUB
E ALUMINA/CN
L15 1 SEA ALUMINA/CN
L16 385 SEA (AL(L)O)/ELS (L) 2/ELC.SUB
E SILICA/CN
L17 1 SEA SILICA/CN
L18 713 SEA (SI(L)O)/ELS (L) 2/ELC.SUB
E ZIRCONIA/CN
L19 1 SEA ZIRCONIA/CN
L20 178 SEA (ZR(L)O)/ELS (L) 2/ELC.SUB
E TITANIA/CN
L21 1 SEA TITANIA/CN
L22 474 SEA (TI(L)O)/ELS (L) 2/ELC.SUB

FILE 'HCA' ENTERED AT 17:40:24 ON 21 SEP 2007

L23 1390692 SEA (L13 OR L14 OR L15 OR L16 OR L17 OR L18 OR L19 OR
L20 OR L21 OR L22) OR B2O3 OR AL2O3 OR ALUMINA# OR SIO2
OR SILICA# OR ZRO2 OR ZIRCONIA# OR TIO2 OR TITANIA#

FILE 'REGISTRY' ENTERED AT 17:40:28 ON 21 SEP 2007

L24 509022 SEA (T1 OR T2 OR T3 OR B2)/PG AND (C (L) O (L) X)/ELS
L25 305632 SEA L24 AND CCS/CI
L26 305632 SEA L25 OR L25
L27 155632 SEA RAN=(,150152-50-4) L25 OR L25
L28 150000 SEA RAN=(150152-51-5,) L25 OR L25

FILE 'HCA' ENTERED AT 17:46:09 ON 21 SEP 2007

L29 114661 SEA L27 OR L28

FILE 'REGISTRY' ENTERED AT 17:52:50 ON 21 SEP 2007

L30 673044 SEA M/ELS AND (C (L) O (L) X)/ELS
L31 359110 SEA L30 AND CCS/CI
L32 53478 SEA L31 NOT L26

FILE 'HCA' ENTERED AT 17:58:50 ON 21 SEP 2007

L33 21658 SEA L32
L34 2 SEA L9 AND L33
L35 0 SEA L9 AND L29
L36 192 SEA L9 AND L23
L37 201272 SEA TRANSITION?(2A)METAL####
L38 20 SEA L9 AND L37
L39 16 SEA L38 AND L36
L40 16 SEA L39 NOT L34
L41 185585 SEA RARE#(2A)EARTH# OR LANTHANID? OR LANTHANON? OR
LANTHANOID?
L42 6 SEA L9 AND L41
L43 19 SEA (L40 OR L42) NOT L34
L44 11 SEA 1840-2002/PY,PRY AND L43

=> FILE HCA

FILE 'HCA' ENTERED AT 18:06:18 ON 21 SEP 2007

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=> D L34 1-2 CBIB ABS HITSTR HITIND

L34 ANSWER 1 OF 2 HCA COPYRIGHT 2007 ACS on STN

143:18605 Electrically resisting powders for rare earth metal magnets, rare earth metal magnets, methods for their manufacture, rotors for motors, and motors. Satsu, Yuichi; Komuro, Yasuhiro; Watabe, Noriyuki; Tayu, Tetsuro; Ono, Hideaki; Kanô, Makoto; Shimada, Munekatsu (Hitachi Ltd., Japan; Nissan Motor Co., Ltd.). Jpn. Kokai Tokkyo Koho JP 2005142374 A 20050602, 18 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2003-377626 20031107.

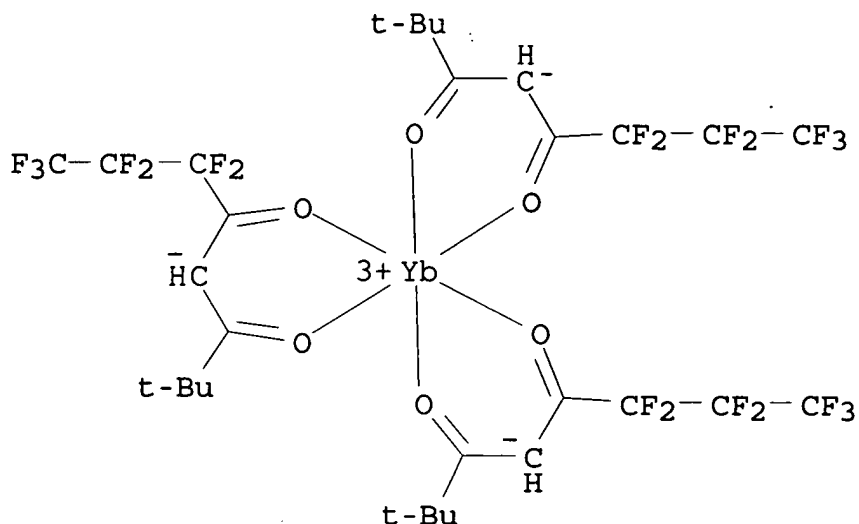
AB Powder for rare earth metal magnets, equipped with coatings contg. ≥ 1 compds. of Tb, Dy, Ho, Er, Tm, Yb, and/or Lu and ≥ 1 metal compds. contg. Al_2O_3 , SiO_2 , SiC , TiO_2 , ZnO , and ZrO_2 , are claimed. The powder is manufd. by heat treatment of a mixt. of oxides of the said rare earth metals and an org. soln. of rare earth metal complex of formula RL_3 [R = the said rare earth metal; L = neg. ion ligand of COMeCHCOME- , $\text{COCMe}_3\text{CHCOCMe}_3-$, $\text{CO}(\text{C}_3\text{F}_7)\text{CHCOCMe}_3-$, $\text{CO}(\text{CF}_3)\text{CHCO}(\text{CF}_3)-$, β -diketonato ion, $(\text{O}-i-\text{C}_3\text{H}_7)-$, $(\text{OC}_2\text{H}_4\text{OMe})-$], under deoxidized atm. for formation of rare earth metal oxide coating on rare earth metal magnet particles, followed by application of the said metal compd. coatings. Also claimed is manuf. of the coated particles by heating of a mixt. of the (a) the rare earth metal oxide-coated powder, (b) the said metal oxides, and (c) a mixt. of an org. solvent contg. ≥ 1 metal alkoxides or metal diketones under deoxidized atm., followed by heat treatment of the powder with a mixt. of Si nitride or polysilazane having extreme low polarity under deoxidized atm.. A similar process carried out in an aq. media or a water-sol. org. solvent is also claimed. The above manufd. coated particles are filled in a mold, pressed under application of magnetic field, and then hot worked to give rare earth metal magnets. Thus manufd. rare earth metal magnets, rotors including the magnets, and motors with the rotors are also claimed.

IT 18323-96-1, Ytterbium tris(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)

(sol-gel coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

RN 18323-96-1 HCA

CN Ytterbium, tris(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionato- κO , $\kappa\text{O}'$)-(9CI) (CA INDEX NAME)



- IC ICM H01F001-09
ICS B22F001-02; B22F003-02; H01F001-053; H01F001-06; H02K001-27;
H02K015-03
- CC 77-8 (Magnetic Phenomena)
Section cross-reference(s): 57
- ST rare earth metal powder magnet rotor motor; oxide double layer
coated magnetic powder; **sol gel** coating bilayer
oxide magnetic powder
- IT **Sol-gel** processing
(coating; **sol-gel** coating of elec.-resisting
rare earth alloy powder with bilayer coatings including rare
earth oxides and their use in prepn. of magnets for rotors in
elec. motors)
- IT Rare earth oxides
(coatings; **sol-gel** coating of elec.-resisting
rare earth alloy powder with bilayer coatings including rare
earth oxides and their use in prepn. of magnets for rotors in
elec. motors)
- IT Silazanes
(di-Me; **sol-gel** coating of elec.-resisting
rare earth alloy powder with bilayer coatings including rare
earth oxides and their use in prepn. of magnets for rotors in
elec. motors)
- IT Magnets
(rare earth metal; **sol-gel** coating of
elec.-resisting rare earth alloy powder with bilayer coatings
including rare earth oxides and their use in prepn. of magnets
for rotors in elec. motors)
- IT Electric motors
(rotors; **sol-gel** coating of elec.-resisting

rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT Silicates, reactions

(**sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT Coating process

(**sol-gel**; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1308-87-8P, Dysprosium oxide 1314-37-0P, Ytterbium oxide
12036-44-1P, Thulium oxide 12055-62-8P, Holmium oxide
12061-16-4P, Erbium oxide

(coating; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1314-13-2, Zinc oxide, processes 1314-23-4, Zirconia, processes
1344-28-1, Alumina, processes 7631-86-9, Silica, processes
12033-89-5, Silicon nitride, processes 13463-67-7, Titania, processes

(coating; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 94282-59-4 639086-68-3 852620-73-6 852620-75-8

(magnetic particles; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 11099-06-2, Tetraethoxysilane homopolymer 12002-26-5;

Tetramethoxysilane homopolymer

(oligomeric; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 1071-76-7 13963-57-0, Aluminum tris(2,4-pentanedionate)
14024-63-6, Zinc acetylacetonate 14637-88-8, Dysprosium
tris(2,4-pentanedionate) 14814-07-4, Tris(isopropoxy)erbium
15522-73-3, Holmium tris(2,2,6,6-tetramethyl-3,5-heptanedionate)
15631-58-0 17927-72-9, Titanim disopropoxide bis(2,4-
pentanedionate) 18323-96-1, Ytterbium tris(6,6,7,7,8,8,8-
heptafluoro-2,2-dimethyl-3,5-octanedionate) 32169-90-7,
Poly[imino(dimethylsilylene)]

(**sol-gel** coating of elec.-resisting rare

earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

IT 64-17-5, Ethyl alcohol, uses 67-56-1, Methyl alcohol, uses 67-63-0, Isopropyl alcohol, uses 71-36-3, n-Butyl alcohol, uses 108-88-3, Toluene, uses

(solvent; **sol-gel** coating of elec.-resisting rare earth alloy powder with bilayer coatings including rare earth oxides and their use in prepn. of magnets for rotors in elec. motors)

L34 ANSWER 2 OF 2 HCA COPYRIGHT 2007 ACS on STN

139:247586 Modified **metal oxide nanoparticle**

suspensions with hydrophobic inclusions. Geiger, Albert; Griebel, Dragan; Herrmann, Rupert; Kuerzinger, Konrad (Roche Diagnostics G.m.b.H., Germany; Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V.; F. Hoffmann-La Roche A.-G.). PCT Int. Appl. WO 2003074420 A1 20030912, 43 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2003-EP2198 20030304. PRIORITY: DE 2002-10209744 20020306.

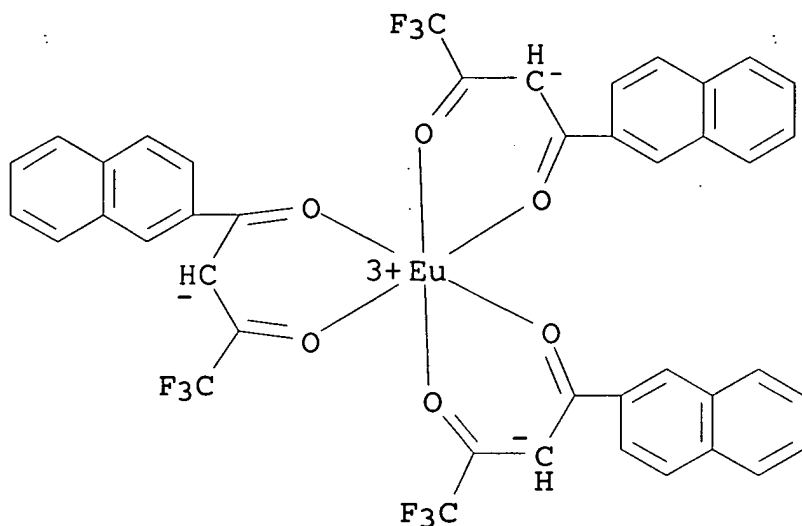
AB Modified **metal oxide nanoparticles** are prepd. by the **sol-gel** process contg. hydrophobic inclusions and can include dye-type mols. as well as halogen-contg. lanthanide coordination compds. The **sol-gel** process includes controlled hydrolysis of metal oxide or metal halide precursors, esp. tetraethoxysilane and tetramethoxysilane, in the presence of a fluoro-org. alkoxysilane or an arylalkoxy silane, which incorporates hydrophobic or oleophobic target mols. into the nanoparticles. These manufd. nanoparticles have use esp. as toners, sunscreen products, insecticides, and for marking of biomols.

IT 80233-27-8P 291301-67-2P 600152-95-2P 600152-96-3P 600152-97-4P

(incorporation of; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

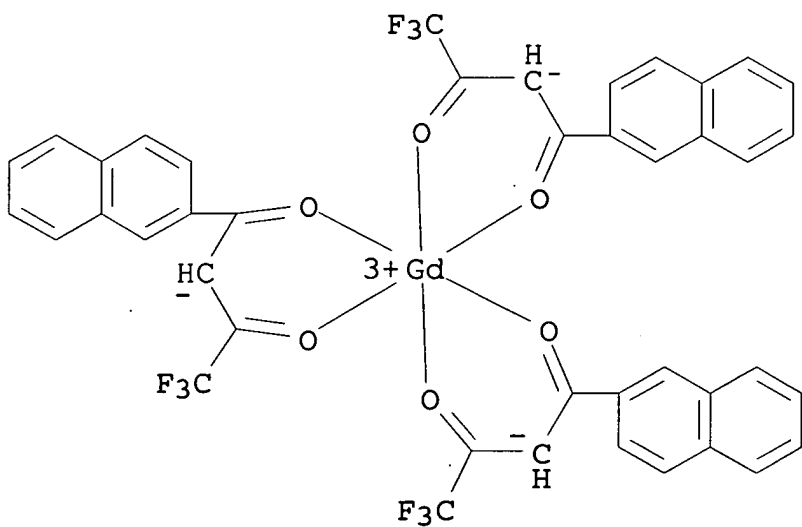
RN 80233-27-8 HCA

CN Europium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato- $\kappa O, \kappa O'$]- (9CI) (CA INDEX NAME)



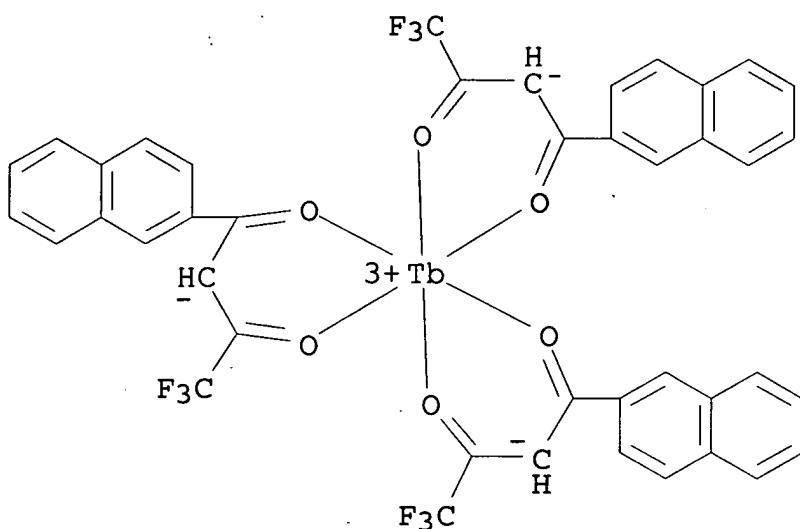
RN 291301-67-2 HCA

CN Gadolinium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato-κO,κO']- (9CI) (CA INDEX NAME)

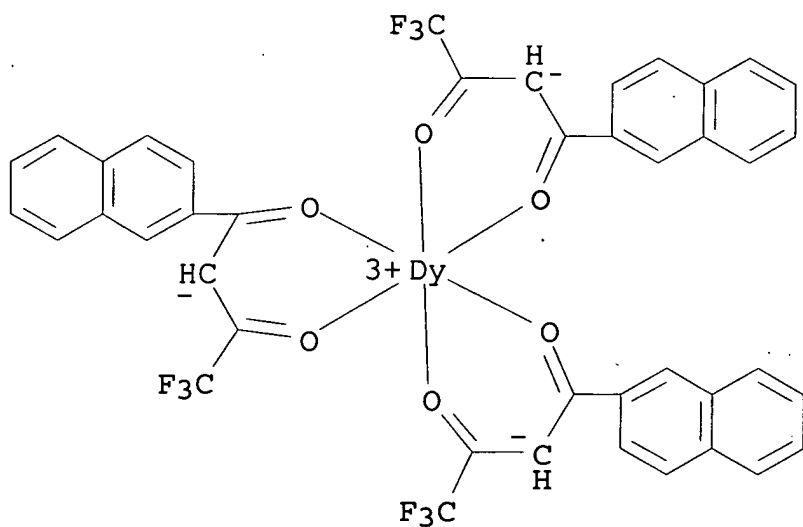


RN 600152-95-2 HCA

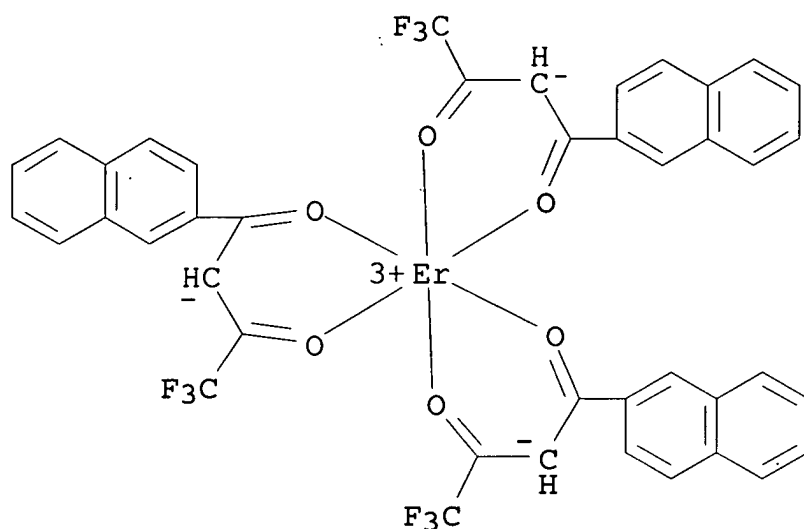
CN Terbium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato-κO,κO']- (9CI) (CA INDEX NAME)



RN 600152-96-3 HCA
 CN Dysprosium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato-κO,κO']- (9CI) (CA INDEX NAME)



RN 600152-97-4 HCA
 CN Erbium, tris[4,4,4-trifluoro-1-(2-naphthalenyl)-1,3-butanedionato-κO,κO']- (9CI) (CA INDEX NAME)



- IC ICM C01B033-14
- ICS C09C001-28; C09C003-00; C01B013-32; C01B033-113
- CC 49-7 (Industrial Inorganic Chemicals)
- Section cross-reference(s): 9, 15, 63
- ST biomol marker modified oxidic nanoparticle; lanthanide complex dye
oleophobic nanoparticle; insecticide marker modified oxidic
nanoparticle; antibody marker modified oxidic nanoparticle;
sol gel hydrophobic silica nanoparticle
fluoroalkyl silane
- IT Ketones, preparation
(1,3-diketones, fluoro, rare earth metal complexes, incorporation
of; modified **metal oxide nanoparticle**
suspensions with hydrophobic inclusions)
- IT Antibodies and Immunoglobulins
(antidigoxigenin, markers for; modified **metal**
oxide nanoparticle suspensions with hydrophobic
inclusions)
- IT Rare earth complexes
(fluoro 1,3-diketone, incorporation of; modified **metal**
oxide nanoparticle suspensions with hydrophobic
inclusions)
- IT Electrophotographic toners
Insecticides
(markers for; modified **metal oxide**
nanoparticle suspensions with hydrophobic inclusions)
- IT Biochemical compounds
(markers for; modified **metal oxide**
nanoparticle suspensions with hydrophobic inclusions)
- IT **Sol-gel** processing
(modified **metal oxide nanoparticle**

- suspensions with hydrophobic inclusions)
- IT Test kits
(strips, for immunol. testing; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 93642-68-3
(hydrophilic silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 429-60-7, 3,3,3-Trifluoropropyltrimethoxysilane
(hydrophobic silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 893-33-4DP, lanthanide metal complexes 80233-27-8P
245670-26-2P, LightCyclerRed 640 291301-67-2P
600152-95-2P 600152-96-3P 600152-97-4P
600152-98-5P 600152-99-6P 600153-00-2P
(incorporation of; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 1672-46-4, Digoxigenin
(markers for antibodies against; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 1303-86-2, Boron oxide (B₂O₃), uses
(**nanoparticles**; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7631-86-9,
Silica, uses 13463-67-7, Titania, uses
(**nanoparticles**; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)
- IT 78-10-4, Tetraethoxysilane 681-84-5, Tetramethoxysilane
(silica source; modified **metal oxide nanoparticle** suspensions with hydrophobic inclusions)

=> D L44 1-11 CBIB ABS HITSTR HITIND

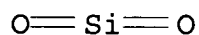
L44 ANSWER 1 OF 11 HCA COPYRIGHT 2007 ACS on STN

145:171895 Method for manufacturing ultrafine spherical ni particle.
Jung, Gyeong Yeol; Kang, Yun Chan; Park, Hui Dong; Son, Jong Rak
(Korea Research Institute of Chemical Technology, S. Korea). Repub.
Korean Kongkae Taeho Kongbo KR 2004047154 A 20040605, No pp. given
(Korean). CODEN: KRXXA7. APPLICATION: KR 2002-75262 20021129.

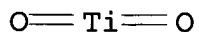
AB A method for manufg. spherical Ni **metal** or nickel
oxide fine particle having non-porous densified
internal structure by adding colloid soln. also during prepn. of
precursor spray soln. in prepn. method of Ni metal fine particle

using spray pyrolysis is provided. The method comprises the processes of prepg. a Ni precursor soln. by dissolving a nickel compd. selected from nickel nitrate, nickel acetate, nickel chloride, nickel hydrate, and nickel sulfate into nano metal colloid soln.; generating droplets having diam. of 0.1 to 100 μ m by injecting the precursor soln. into a droplet sprayer; and drying and pyrolyzing the generated droplets in the reactor temp. range of 500 to 1,500°C, wherein the size of metal particles in the nano metal colloid soln. is 10 to 500 nm, wherein the nano metal colloid soln. is prepd. by dispersing a metal nano particle selected from nano **silica**, nano **titania**, nano silver, nano yttria, nano nickel and hydrate particle thereof into a water sol. or org. solvent, wherein the nano metal colloid soln. is prepd. by **sol-gel** reacting the mixt. after prepg. a mixt. by mixing a metal compd. selected from nitrate, acetate, chloride, hydrate and sulfate of a metal selected from **metals**, **transition metals** and **lanthanide** metals of group I to group IV in the periodic table with urea in a mole ratio of 1:1 to 1:1,000, and wherein the nano metal colloid soln. is prepd. by **sol-gel** reacting the soln. after dissolving and dispersing a metal alkoxide selected from titanium isopropoxide, tetraethoxy orthosilicate (TEOS) and a mixt. thereof into a solvent.

IT 7631-86-9, **Silica**, processes 13463-67-7,
Titania, processes
 (colloid component; manufg. ultrafine spherical Ni or Ni oxide particles by spray pyrolysis of colloid soln.)
 RN 7631-86-9 HCA
 CN Silica (CA INDEX NAME)



RN 13463-67-7 HCA
 CN Titanium oxide (TiO₂) (CA INDEX NAME)



IC ICM B22F009-08
 CC 56-4 (Nonferrous Metals and Alloys)
 Section cross-reference(s): 57
 IT Colloids
 Nanoparticles
Sol-gel processing
 (manufg. ultrafine spherical Ni or Ni oxide particles by spray pyrolysis of colloid soln.)
 IT 57-13-6, Urea, processes 1314-36-9, Yttria, processes 7440-22-4,

Silver, processes 7631-86-9, Silica, processes

13463-67-7, Titania, processes

(colloid component; manufg. ultrafine spherical Ni or Ni oxide particles by spray pyrolysis of colloid soln.)

L44 ANSWER 2 OF 11 HCA COPYRIGHT 2007 ACS on STN

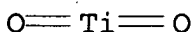
136:91382 Ultrathin composite films: An indispensable resource for nanotechnology. Ichinose, Izumi; He, Junhui; Fujikawa, Shigenori; Hashizume, Mineo; Huang, Jianguo; Kunitake, Toyoki (Topochemical Design Laboratory, Frontier Research System, RIKEN, Japan). RIKEN Review, 37, 34-37 (English) 2001. CODEN: RIREE6. ISSN: 0919-3405. Publisher: Institute of Physical and Chemical Research.

AB Ultrathin nanocomposite films were prepd. on solid supports via adsorption of org. and inorg. mols. from soln. Coordination geometry for **transition metal** ions was preserved by embedding metal ligands into titanium oxide gel films, and porous titanium oxide films were prepd. by selective removal of org. components from polymer/metal oxide composite films using oxygen plasma processing. **Nanoparticles** coated with thin **metal oxide** films were employed to form hollow shell structures, and wrapping of mols. with thin metal oxide layers was successfully achieved by controlled reaction in soln. These new methodologies based on ultrathin composite films should be useful as fundamental tools for the prepn. of nano-structured materials.

IT 13463-67-7P, Titania, properties
(deposition and plasma treatment of **titania**/polymer composite ultrathin films imprinted by **transition metal** ions).

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (CA INDEX NAME)

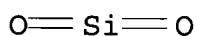


CC 66-4 (Surface Chemistry and Colloids)

ST **titania** film deposition **sol gel**
process oxygen plasma treatment; polymer **titania** composite film **sol gel** process

IT Adsorption
Composites
Microstructure
Plasma
Porous materials
Sol-gel processing
Transmission electron microscopy
(deposition and plasma treatment of **titania**/polymer composite ultrathin films imprinted by **transition metal** ions)

- IT 9002-98-6P 9011-14-7P, Poly(methyl methacrylate)
 13463-67-7P, **Titania**, properties
 (deposition and plasma treatment of **titania**/polymer
 composite ultrathin films imprinted by **transition**
metal ions)
- IT 15158-11-9, Copper(2+), reactions 23713-49-7, Zinc(2+), reactions
 (deposition and plasma treatment of **titania**/polymer
 composite ultrathin films imprinted by **transition**
metal ions)
- L44 ANSWER 3 OF 11 HCA COPYRIGHT 2007 ACS on STN
 135:214698 Synthesis of ceramic powders by using lamellar **silica**
 as precursor. de Farias, R. F. (Departamento de Quimica,
 Universidade Federal de Roraima, UFRR, Boa Vista Roraima, 69301-970,
 Brazil). Journal of Non-Crystalline Solids, 288(1-3), 218-220
 (English) 2001. CODEN: JNCSBJ. ISSN: 0022-3093.
 Publisher: Elsevier Science B.V..
- AB In this work, it is shown that, by using lamellar **silica**
 samples and metal chlorides as precursors, homogeneous ceramic
 powders of the type **SiO₂-MO**, with M=Zn, Mn, Ni and Co, can
 be synthesized. The powders were obtained by dispersion of 2.0 g of
 lamellar **silica** powders in 200 cm³ of a 0.5 mol.dm⁻³ soln.
 of the resp. metal chloride, followed by filtration and calcination
 at 600°C for 30 min in an oxidizing atm. As verified by the
 mapping of the elements, performed by SEM and EDX anal., the powders
 are chloride free, whereas silicon and M are homogeneously
 distributed. The M/Si ratio for the calcined samples are 0.93,
 1.14, 1.64 and 1.62 for M=Zn, Mn, Ni and Co, resp. The BET surface
 areas for the same previous sequence of powders are 33 ±3, 26
 ±1.4, 20 ±0.2 and 43 ±0.2 m².g⁻¹, resp.
- IT 7631-86-9, **Silica**, processes
 (composite powders; **sol-gel** synthesis of
 homogeneous ceramic composite powders using lamellar
silica and metal chlorides as precursors)
- RN 7631-86-9 HCA
 CN **Silica** (CA INDEX NAME)



- CC 57-2 (Ceramics)
 Section cross-reference(s): 49
- ST **silica transition metal oxide**
 composite **powder** prepn lamellar **silica**; zinc
 oxide **silica** composite powder prepn lamellar
silica precursor; manganese oxide **silica** composite
 powder prepn lamellar **silica** precursor; nickel oxide
silica composite powder prepn lamellar **silica**

precursor; cobalt oxide **silica** composite powder prep
lamellar **silica** precursor

IT **Powders**

(ceramic, **silica-transition metal oxide** composite; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT **Ceramics**

(**powders, silica-transition metal oxide** composite; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT **Ceramic composites**

(**silica-transition metal oxide powders; sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT **Calcination**

Sol-gel processing

Surface area

(**sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT **7631-86-9, Silica, processes**

(composite powders; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT 1307-96-6P, Cobalt oxide coo, preparation 1313-99-1P, Nickel oxide (NiO), preparation 1314-13-2P, Zinc oxide (ZnO), preparation 1344-43-0P, Manganese oxide (MnO); preparation

(composite powders; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

IT 78-10-4, Teos 7646-79-9, Cobalt Chloride, processes 7646-85-7, Zinc Chloride, processes 7718-54-9, Nickel Chloride, processes 11132-78-8, Manganese Chloride

(precursor; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

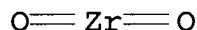
IT 2783-17-7, 1,12-Diaminododecane

(sequestering agent; **sol-gel** synthesis of homogeneous ceramic composite powders using lamellar **silica** and metal chlorides as precursors)

oxides. Wu, Nae-Lih (Department of Chemical Engineering, National Taiwan University, Taipei, 106, Taiwan). Advances in Science and Technology (Faenza, Italy), 29(Mass and Charge Transport in Inorganic Materials, Part B), 839-846 (English) 2000.

CODEN: ASETES. Publisher: Techna.

- AB Crystallite growth upon calcination of hydrous **transition metal** oxide gels can be effectively inhibited by replacing the surface hydroxyl group prior to calcination with Me siloxyl, which does not condense and can produce small secondary-phase particles which restrict advancing of grain boundaries at elevated temps. This pretreatment allows the gel, upon calcination, to crystallize, while suppressing growth of existing crystals. As a result, the gel is uniformly crystd. to give nanocrystallites with a size less than 10 nm. Examples of SnO₂ and ZrO₂ are given. For the latter, the pretreatment also enhances the metastability of tetragonal crystallites.
- IT 1314-23-4P, Zirconium oxide (ZrO₂), preparation (ceramics; inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal** oxides)
- RN 1314-23-4 HCA
- CN Zirconium oxide (ZrO₂) (CA INDEX NAME)



- CC 57-2 (Ceramics)
- ST **metal oxide sol gel**
synthesis **grain** growth nanocryst
- IT **Transition metal oxides**
(ceramics; inhibited **grain** growth in **sol-gel** synthesis of nanocryst. **transition metal** oxides)
- IT Calcination
Crystal growth
Crystallization
Dehydroxylation
Heat treatment
Microstructure
Sol-gel processing
(inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal** oxides)
- IT Stability
(metastability, of tetragonal crystallites; inhibited grain growth in **sol-gel** synthesis of nanocryst. **transition metal** oxides)
- IT Ceramics
(nanocryst.; inhibited grain growth in **sol-gel**

synthesis of nanocryst. **transition metal**
oxides)

IT 1314-23-4P, Zirconium oxide (ZrO₂), preparation
18282-10-5P, Tin oxide (SnO₂)
(ceramics; inhibited grain growth in **sol-gel**
synthesis of nanocryst. **transition metal**
oxides)

IT 1314-36-9, Yttria, uses
(inhibited grain growth in **sol-gel** synthesis
of nanocryst. **transition metal** oxides)

L44 ANSWER 5 OF 11 HCA COPYRIGHT 2007 ACS on STN

135:40053 New oxygen sensitive films for oxygen sensor. Xu, Mingxia;
Zheng, Liaoying; Liu, Liyue; Fan, Liying; Xu, Tingxian (School of
Materials Science and Engineering, Tianjin University, Tianjin,
300072, Peop. Rep. China). Cailiao Yanjiu Xuebao, 15(1), 17-22
(Chinese) 2001. CODEN: CYXUEV. ISSN: 1005-3093.
Publisher: Cailiao Yanjiu Xuebao Bianjibu.

AB Three types oxygen nanometer particle film materials, including
transitional metal oxide (MoO₂, TiO_x and CrO_x
etc.), perovskite-type (SrTiO₃/LaNiO₃, LaNiO₃ and LaCrO₃ etc.) and
perovskite-like type (La_{1-x}M_xNiO₄), were prep'd. by **sol-**
gel. The expt. results showed that comparing with the
traditional **ZrO₂**, **TiO₂** semiconductor materials
for oxygen sensor, these three types materials have low coeffs. of
resistance-temp., high sensitivity to the change of circumstance
oxygen and rapid response.

IT 12065-65-5, Titanium oxide (Ti₃O₅) 13463-67-7,
Titanium oxide (**TiO₂**), uses
(evaluation of nanometer particle film materials for oxygen
sensors)

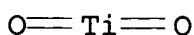
RN 12065-65-5 HCA

CN Titanium oxide (Ti₃O₅) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	5	17778-80-2
Ti	3	7440-32-6

RN 13463-67-7 HCA

CN Titanium oxide (TiO₂) (CA INDEX NAME)



CC 79-2 (Inorganic Analytical Chemistry)

IT **Transition metal oxides**

(evaluation of nanometer **particle** film materials for oxygen sensors)

IT 11118-57-3, Chromium oxide 12017-94-6, Chromium lanthanum oxide (CrLaO3) 12031-18-4, Lanthanum nickel oxide (LaNiO3) 12031-41-3, Lanthanum nickel oxide (La2NiO4) 12060-59-2, Strontium titanate (SrTiO3) 12065-65-5, Titanium oxide (Ti3O5) 13463-67-7, Titanium oxide (TiO2), uses 18868-43-4, Molybdenum oxide (MoO2)

(evaluation of nanometer particle film materials for oxygen sensors)

L44 ANSWER 6 OF 11 HCA COPYRIGHT 2007 ACS on STN

135:23457 Manufacture of ceramic parts for microsystems by **sol-gel** method. Penth, Bernd (Germany). Ger. Offen. DE 19957723 A1 20010613, 2 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1999-19957723 19991130.

AB The green compacts of ceramic articles with a size of ≤ 1 mm are manufd. by prepg. a dispersion of **metal oxide powder** having a **particle** size of ≤ 5 μ m in an inorg. sol (esp. **silica** sol), filling the mold, drying, and firing. The inorg. sol is made by (a) dissolving a metal chloride or nitrate in water, (b) dissolving a metal salt in HCl or HNO3, or (c) hydrolysis of org. metal compd. (e.g., titanium alcoholate) with HCl or HNO3. Metal oxides are selected from **TiO2, alumina, and zircon.**

IT 1344-28-1, **Alumina**, processes 13463-67-7, Titanium oxide (TiO2), processes

(sol dispersion of; manuf. of ceramic parts for microsystems by **sol-gel** method)

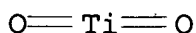
RN 1344-28-1 HCA

CN Aluminum oxide (Al2O3) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 13463-67-7 HCA

CN Titanium oxide (TiO2) (CA INDEX NAME)



IC ICM C04B035-00

ICS C04B035-01

CC 57-2 (Ceramics)

ST ceramic **silica sol gel** metal oxide

IT **Transition metal** chlorides

(aq. solns.; manuf. of ceramic parts for microsystems by **sol-gel** method)

IT **Powders**

(ceramic, **metal oxide**; manuf. of ceramic parts for microsystems by **sol-gel** method)

- IT **Silica gel, processes**
(dispersion of; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Sol-gel processing**
(green compacts of ceramic; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Ceramics**
(green compacts of; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Nitrates, processes**
(metal nitrates, aq. solns.; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Dispersion (of materials)**
(metal oxide slip; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Ceramics**
(**powders, metal oxide**; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **Metal alkoxides**
(titanium, hydrolysis in acids; manuf. of ceramic parts for microsystems by **sol-gel** method)
- IT **1344-28-1, Alumina, processes 13463-67-7**
, Titanium oxide (**TiO₂**), processes 14940-68-2, Zircon
(sol dispersion of; manuf. of ceramic parts for microsystems by **sol-gel** method)
- L44 ANSWER 7 OF 11 HCA COPYRIGHT 2007 ACS on STN
- 134:125072 Metal oxides. Phase transformation from solid precursors. Sugimoto, Tadao (Institute for Advanced Materials Processing, Tohoku University, Sendai, Japan). Surfactant Science Series, 92 (Fine Particles), 58-83 (English) 2000. CODEN: SFSSA5. ISSN: 0081-9603. Publisher: Marcel Dekker, Inc..
- AB A review with 37 refs. The prepn. of monodisperse **particles** of various **metal oxides** via a **sol gel** route is described. It is distinguished between the pptn. from a dild. soln. and the prepn. from a condensed system. Among the systems treated are: Co₃O₄, Fe₃O₄, Fe₂O₃, ferrites, **TiO₂**, **ZrO₂**, CuO, and Cu₂O. The growth mechanisms and resulting microstructures of the oxide particles are discussed.
- CC 78-0 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 75
- ST review **transition metal oxide nanoparticle sol gel** prepn
microstructure
- IT Microstructure
(of **transition metal oxides** prepd. via **sol-gel** route with phase transformation from

- solid precursors)
- IT **Sol-gel processing**
(prepn. of **transition metal** oxides via
sol-gel route with phase transformation from
solid precursors)
- IT **Transition metal oxides**
(prepn. of **transition metal** oxides via
sol-gel route with phase transformation from
solid precursors)
- L44 ANSWER 8 OF 11 HCA COPYRIGHT 2007 ACS on STN
129:139481 Optical fibers by a hybrid process using **sol-gel silica** overcladding tubes. MacChesney, J. B.;
Johnson, D. W., Jr.; Bhandarkar, S.; Bohrer, M. P.; Fleming, J. W.;
Monberg, E. M.; Trevor, D. J. (Bell Laboratories, Lucent
Technologies, Murray Hill, NJ, 07974, USA). Journal of
Non-Crystalline Solids, 226(3), 232-238 (English) 1998.
CODEN: JNCSBJ. ISSN: 0022-3093. Publisher: Elsevier Science B.V..
- AB We have successfully developed a **sol-gel** process
to produce large **silica** glass bodies to be used as optical
fiber preform overcladding tubes which meet the demands of optical
fiber. We have made and tested tubes weighing approx. 4.5 kg, which
comprise about 90% of the eventual fiber's mass. This **sol**
-gel process uses colloidal **silica** dispersed in
high pH water. The **sol** is cast, **gelled** by
reducing the pH and dried to a porous tube. The dried body is heat
treated to remove orgs., to dehydrate and to purify by removing both
refractory **oxide particles** and
transition metal ions to the parts/billion range
and then sintered to transparency in He. These tubes are
competitive with vapor deposited synthetic **silica** tubes
and produce fiber meeting current com. stds. Net shape formation of
large precision glass bodies by gel casting is demonstrated.
- IT **60676-86-0P, Vitreous silica**
(optical fiber preform overcladding tubes; optical fibers by a
hybrid process using **sol-gel silica**
overcladding tube preforms)
- RN 60676-86-0 HCA
- CN Silica, vitreous (CA INDEX NAME)
- *** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
- CC 57-1 (Ceramics)
Section cross-reference(s): 73
- ST glass **silica sol gel** overcladding
tube; optical fiber **sol gel silica**
preform
- IT Molding of ceramics
(casting, gel-casting; optical fibers by a hybrid process using
sol-gel silica overcladding tube

- preforms)
- IT Heat treatment
(dehydration/purifn. by; optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)
- IT Dehydration
Purification
(of preform; optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)
- IT Sintering
(of **silica** preform; optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)
- IT Optical fibers
Sol-gel processing
(optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)
- IT Pipes and Tubes
(**silica** overcladding; optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)
- IT **60676-86-0P, Vitreous silica**
(optical fiber preform overcladding tubes; optical fibers by a hybrid process using **sol-gel silica** overcladding tube preforms)

L44 ANSWER 9 OF 11 HCA COPYRIGHT 2007 ACS on STN

125:71389 Manufacture of silica glass optical waveguide. Konishi, Shigeru; Kama, Kazuo (Shinetsu Chemical Industry Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 08091856 A 19960409 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-226506 19940921.

AB The manuf., for an optical waveguide contg. a lower cladding layer (A), a core layer (B) of a higher-refractive index than that of A, and an upper cladding layer (C) of a lower-refractive index than that of B, comprises these steps: forming a porous-glass layer by coating a sol soln., prepd. by mixing a Si alkoxide-hydrolyzed sol obtained by adding another metal alkoxide(s), with a dispersed soln. of a **micro-powdery metal oxide**, on a substrate, transparent-vitrifying it by heating to form a silica glass-thin film layer, and repeating these steps. The Si alkoxide may be a mixt. with Ti-, Ge-, Al-, or a **rare earth** -alkoxide. The **metal oxide micro-powder** may be silica, titania, germania, alumina, Er₂O₃, Nd₂O₃, and/or Dy₂O₃. The manuf. provides a crack-less silica-type optical waveguide glass in an improved through put.

IC ICM C03B019-12
ICS C03B020-00; G02B006-13

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 57

ST silica glass optical waveguide refractive index; **sol gel** coating optical waveguide

IT Waveguides

(optical, Manuf. of silica-glass optical waveguide by **sol -gel** method)

IT Coating process

(**sol-gel**, Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 52337-09-4P, Silicon titanium oxide

(core layer; Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 7429-90-5D, Aluminum, alkoxide 7440-56-4D, Germanium, alkoxide

(sol component; Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 7631-86-9P, Aerosil 130, properties

(sol soln.; Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 78-10-4, Silicon tetraethoxide 546-68-9, Titanium

tetraisopropoxide 1308-87-8, Dysprosium oxide 1308-96-9, Europium oxide 1310-53-8, Germania, uses 1313-97-9, Neodymium oxide 1344-28-1, Alumina, uses

(sol soln.; Manuf. of silica-glass optical waveguide by **sol-gel** method)

IT 13463-67-7, P 25, uses

(sol soln.; Manuf. of silica-glass optical waveguide by **sol-gel** method)

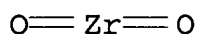
L44 ANSWER 10 OF 11 HCA COPYRIGHT 2007 ACS on STN

107:80484 Monolithic gel and **powder of transition metal oxides**, and thin films of these oxides.

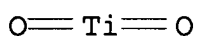
Henry, Marc; Vioux, Andre; Livage, Jacques (Centre National de la Recherche Scientifique, Fr.). Fr. Demande FR 2585973 A1 19870213, 17 pp. (French). CODEN: FRXXBL. APPLICATION: FR 1985-12019 19850806.

AB The title materials are prep'd. by carboxylic acid-catalyzed hydrolysis of an alc. soln. of a comp'd. of the formula MX_n [M = e.g., Ti, Zr, Nb, or Ta; X = R1O or R1C(O)CR2 = CR3O; R1,3 = alkyl; R2 = H or alkyl]. The resulting oxide gel may contain a doping element, e.g., Al or Cr in the case of Ti. The gel may be dried to yield fine oxide powder, or may be applied to a substrate to give oxide thin films. (BuO)4Ti 3.6 was mixed with AcOH 1 and BuOH-10% H2O 10 mL was added; after 2 min at room temp., a transparent, monolithic gel with good mech. properties had formed. The gel was dried at 60° to give a clear TiO2 powder of diam. .apprx.75 nm.

IT 1314-23-4P, Zirconia, preparation
13463-67-7P, Titania, preparation
(sol-gel prepn. of, as powder or films)
RN 1314-23-4 HCA
CN Zirconium oxide (ZrO₂) (CA INDEX NAME)



RN 13463-67-7 HCA
CN Titanium oxide (TiO₂) (CA INDEX NAME)



IC ICM B01J013-00
ICS C01G023-04; C01G025-02; C01G033-00; C01G035-00
CC 49-3 (Industrial Inorganic Chemicals)
Section cross-reference(s): 57, 76
ST **transition metal oxide powder**
film; **sol gel titania powder**
IT Films
(oxide, **sol-gel** prepn. of)
IT Ceramic materials and wares
(powd., **sol-gel** prepn. of)
IT 64-19-7, Acetic acid, uses and miscellaneous
(catalyst, in **sol-gel** prepn. of oxide powders
and films)
IT 3085-30-1, Aluminum tributoxide 3236-82-6, Niobium pentaethoxide
5593-70-4, Titanium tetrabutoxide 21679-31-2, Chromium
triacetylacetonate 23519-77-9, Zirconium tetrapropoxide
(hydrolysis of, in **sol-gel** prepn. of oxide
powders and films)
IT 1313-96-8P 1314-23-4P, Zirconia, preparation
1314-61-0P 13463-67-7P, Titania, preparation
(**sol-gel** prepn. of, as powder or films)
IT 71-36-3, Butanol, uses and miscellaneous
(solvent, in **sol-gel** prepn. of oxide powders
and films)
IT 7429-90-5P, Aluminum, uses and miscellaneous 7440-47-3P, Chromium,
uses and miscellaneous
(**titania** doped with, **sol-gel** prepn.
of)

L44 ANSWER 11 OF 11 HCA COPYRIGHT 2007 ACS on STN
64:57390 Original Reference No. 64:10708b-d Preparation, coating,
evaluation, and irradiation testing of solgel oxide microspheres.
Wymer, R. G.; Coobs, J. H. (Oak Ridge Natl. Lab., Oak Ridge, TN).

U.S. At. Energy Comm., ORNL-P-1725, 17 pp. (English) 1965.

AB Microspheres of ThO₂, PuO₂, ThO₂-UO₂, ThO₂-PuO₂, **rare earth** oxides, and Am and Cm oxides were prepd. at ORNL by **sol-gel** techniques. ThO₂, ThO₂-UO₂, and UO₂ microspheres were coated with pyrolytic C in fluidized beds. Sphere forming was accomplished by dispersing sols in 2-ethyl-1-hexanol contg. appropriate surfactants. The engineering feasibility of microsphere forming was demonstrated by using a variety of sol-dispersing techniques. **Sol-gel** micro-spheres, because of their sphericity and uniform size, are well suited to coating in fluidized beds. The thermal and chemical stabilities of pyrolytic-C-coated ThO₂, ThO₂-UO₂, and UO₂ microspheres were demonstrated by their ability to withstand severe heat treatments (100 hrs. at 1900° in vacuum, or 15 min. at 2600°) without failure, provided the coating thickness is >65 μ. Irradiation results indicate that C-coated oxide microspheres will be satisfactory fuels for high-temp., gas-cooled reactors.

CC 13 (Nuclear Technology)

IT Coating(s)
 (of transuranium **metal oxide particles** with C)

IT Oxides
 (prepn., coating and properties of **sol-gel particles** of)